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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,367	08/15/2001	Tomoyuki Yarinaga	067183-0192	8853

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EXAMINER

MERED, HABTE

ART UNIT PAPER NUMBER

2662

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/929,367

Applicant(s)

YORINAGA, TOMOYUKI ET AL

Examiner

Habte Mered

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/05/03&03/25/04</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claim 1** is rejected under 35 U.S.C. 103(a) as being unpatentable over McClure et al (US 5, 790, 770), hereinafter referred to as McClure, in view of Basso et al (US 6, 690, 678), hereinafter referred to as Basso.

McClure discloses an ATM switch and an ATM network where full flow control and traffic shaping are implemented with hierarchical arbitration at all levels. McClure further discloses that his ATM switch has both input and output buffers and to further prevent output buffer overflows utilizes backpressure control technique. Therefore, McClure's ATM switch meets the objective of the applicant's invention, which is to provide an ATM switch that realizes hierarchical shaping for each virtual channel and each virtual path.

McClure discloses an ATM switch, comprising: one or more input side circuit interfaces; one or more output side circuit interfaces; and an ATM core switch for outputting cells inputted thereto from the input side circuit interface or interfaces to the output side circuit interface or interfaces. **(McClure discloses in Figure 1 an ATM communication network where each node represents an ATM switch. See also Column 3, Lines 37-45. Figure 2 further shows the ATM switch node with a**

plurality of input queues and plurality of output queues. For each virtual channel connection there is a unique input queue and output queue. See Column 4, Lines 1-11)

McClure also discloses each of the output side circuit interfaces feeding back, a cell number accumulated for each virtual channel to a corresponding one of the input side circuit interfaces. **(McClure further discloses a backpressure control technique at the virtual channel connection level (i.e. virtual connection) and at the virtual path connection level (i.e. group of virtual connections) at each ATM switch node where a connection feedback signal is provided from the output queue to the input queue. See also Column 2, Lines 10-25. McClure further details the implementation of the feedback mechanism and indicates that a message will be sent from the output queue to the input queue when the corresponding output buffer becomes filled with a pre-determined threshold level. See Column 5, Lines 61-67 and Column 6, Lines 1-10. It is a must for McClure's system to monitor the output buffer and actually count the number of cells in the output buffer of the virtual channel, as is the case in element 31 of Figure 3. However, it is strictly a design decision whether to send a general message to the input side when the output buffer is filled or to send the actual cell count to the input side on a continuous basis as both methods incorporate monitoring, counting and messaging on a real time basis.)**

McClure, however, fails to expressly disclose the range of values the cell traffic can have when flow control and traffic shaping are turned on a virtual channel connection.

Basso discloses a method of dynamically adjusting the bandwidth of a virtual path connection. Basso also discloses the use of backpressure techniques to prevent cell loss in ATM services. **(See Column 2, Lines 13-15)**

Basso also discloses each of the input side circuit interfaces shaping the rate of cells based on the feedback from a corresponding one of the output side circuit interfaces so that a peak cell rate total value of virtual channels which belong to a virtual path may not exceed a peak cell rate of the virtual path;

Basso also discloses each of the output side circuit interfaces controlling, based on the cell number accumulated for each virtual channel, so that the peak cell rate of the virtual path to which the virtual channels belong may not exceed the peak cell rate total value of the virtual channels which belong to the virtual path

(Basso discloses that within a given virtual path connection (vpc), the total bandwidth of the vpc is allocated among the different virtual channel connections (vcc). See Column 3, Lines 65-67 and Column 4, Lines 1-4. Basso also discloses that the total sum of the quality of service of the virtual channels is less than or equal to the QoS (quality of service) of the virtual path. See Column 8, Lines 10-20. Basso further discloses that ATM has five service categories. See Column 9, Lines 33-38. Each service category has one or more conformance definition distinguished by the manner in which the qualities of service parameters apply to

the cell flows. See Column 9, Lines 1-5. For instance, the Available Bit Rate (ABR) service can be specified with a maximum required bandwidth usually specified as the Peak Cell Rate (PCR) and the minimum usable bandwidth usually specified as Minimum Cell Rate (MCR). Therefore, Basso has disclosed the direct relationship between the QoS (Quality of Service) and cell rate on a virtual connection. Basso has also readily established that the summation of the peak cell rate of the virtual channels cannot exceed the peak cell rate of the virtual path to which all the virtual channels belong to.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify McClure's apparatus by specifying the range of values the cell traffic can have when flow control and traffic shaping are turned on a virtual channel connection, the motivation being to be able to support different ATM services while dynamically adjusting the bandwidth of the virtual connection according to the network load.

3. **Claims 2, 3, 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over McClure et al (US 5, 790, 770), hereinafter referred to as McClure, in view of Basso et al (US 6, 690, 678), hereinafter referred to as Basso, as applied to claim 1 above, and further in view of Bianchini et al (US 6, 526, 024), hereinafter referred to as Bianchini.

4. Regarding **claim 2**, the modified invention of McClure and Basso as taught above disclosed the aforementioned invention including an ATM switch, wherein each of the input side circuit interfaces terminates a cell, and an input virtual channel cell rate

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control section for receiving the cell terminated and controlling the rate of cell for each virtual channel based on the feedback. However, it failed to expressly disclose the input side circuit interface has a physical layer for processing the terminating cells.

Bianchini discloses an ATM switch (**see Figure 7**) input and output ports capable of receiving and sending cells and packets from and to the network. **Figure 2 shows a port of the ATM switch, which happens to be an OC-48 card and has an ATM Physical Layer.**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus that resulted from the combined invention of McClure and Bianchini by making the input and output ports of the ATM switch have a physical layer to process terminating and originating cells, the motivation being to make the ATM switch act as either an end node or an ordinary node of the ATM network it is part of.

5. Regarding **claim 3**, the modified invention of McClure and Basso as taught above disclosed the aforementioned invention including an ATM switch, wherein each of the output side circuit interfaces includes an output virtual channel cell rate control section for storing a cell number accumulated for each virtual channel, an output virtual path cell rate control section for controlling the cell rate for each virtual channel based on the cell number accumulated in the output virtual channel cell rate control section, the output virtual channel cell rate control section feeding back the cell number to the input virtual channel cell rate control section. However, it failed to expressly disclose

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that there is a physical layer section for outputting a cell from the output virtual channel cell rate control section to a circuit.

Bianchini discloses an ATM switch (see **Figure 7**) input and output ports capable of receiving and sending cells and packets from and to the network. **Figure 2 shows a port of the ATM switch, which happens to be an OC-48 card and has an ATM Physical Layer.**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus that resulted from the combined invention McClure and Bianchini by making the input and output ports of the ATM switch have a physical layer to process terminating and originating cells, the motivation being to make the ATM switch act as either an end node or an ordinary node of the ATM network it is part of.

6. Regarding **claim 5**, the modified invention of McClure and Basso as taught above disclosed the aforementioned invention including An ATM switch, wherein the input cell rate control section stores an input circuit number, a service class, a minimum cell rate, an output switch port number and an intra-switch connection identification number of contents of a contract concluded in advance in a corresponding relationship to a virtual path identifier /virtual channel identifier of an input cell. **(Basso discloses a traffic contract that includes quality of service, which inherently should include service class and minimum and peak cell rates at the minimum. See Column 10, Lines 55-60.)**

7. Regarding **claim 6**, the modified invention of McClure and Basso as taught above disclosed the aforementioned invention including an ATM switch, wherein the output virtual channel cell rate control section stores a service class, a virtual channel minimum cell rate, a virtual channel peak cell rate, a virtual path peak cell rate, an output circuit number and an output virtual path identifier/virtual channel identifier of contents of a contract concluded in advance in a corresponding relationship to an intra-switch connection identification number of each cell. **(Basso discloses a traffic contract that includes quality of service, which inherently should include service class and minimum and peak cell rates at the minimum. See Column 10, Lines 55-60.)**

8. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over McClure et al (US 5, 790, 770), hereinafter referred to as McClure, in view of Basso et al (US 6, 690, 678), hereinafter referred to as Basso, as applied to claim 1 above, and further in view of Fukano et al (US 6, 775, 287), hereinafter referred to as Fukano.

The modified invention of McClure and Basso as taught above disclosed the aforementioned invention as taught above but does not disclose output buffer type switching with cell multiplex circuit.

Fukano disclose an ATM switch, wherein the ATM core switch includes multiplexing means for multiplexing cells from all of the output side circuit interface sections, filter means for comparing output port identification numbers applied to the cells with output port numbers of the filter means themselves and passing there through only those cells which exhibit coincidence in the comparison, and a cell buffer of the

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first-in first-out type provided for each output port for temporarily storing those cells which have passed through the corresponding filter means, converting the rate of the cells and outputting the resulting cells to a corresponding one of the output side circuit interfaces. **(See Figure 1 and Column 1, Lines 43-67)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus that resulted from the combined invention of McClure and Bianchini by using an output buffer type switching with cell multiplex circuit, the motivation being to add multicast functionality and make the ATM switch both unicast and multicast.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patent is cited to show the state of the art with respect to hierarchical traffic shaping in virtual connections:

US Patent (6, 643, 293) to Carr et al


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HM
04-01-2005



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